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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,304	01/15/2002	Andrew Sung-On Ng	2345-PAT	1290
7590 03/11/2004				
DONN K. HARMS Suite 100 12792 Via Cortina Del Mar, CA 92014			EXAMINER ALEJANDRO, RAYMOND	
			ART UNIT 1745	PAPER NUMBER

DATE MAILED: 03/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/045,304

Applicant(s)

NG ET AL.

Examiner

Raymond Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 13, 15-23 and 25-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13, 15-23 and 25-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This communication is responsive to the amendment filed 01/12/04. The applicants have overcome most of the objections and the 35 USC 102 rejections. Refer to the abovementioned amendment for specific details on applicant's rebuttal arguments. However, the present claims are finally rejected over art as seen below and for the reasons of record:

Priority

1. Applicant's claim for domestic priority under 35 U.S.C. 119(e) is not acknowledged. In this case, the non-provisional application 10/045304 was filed more than one (1) year from the effective filing date of the provisional application 60/257352. Accordingly, the benefit for domestic priority is not granted.

Claim Objections

2. Claim 11 is objected to because of the following informalities: the recitation "said said first elongated conductor" in line 2-3 should be replaced with the recitation "said first elongated conductor" as the term "said" have been repeated. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-11, 13, 20-23, 28-30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fan et al 2003/0134203 in view of the Japanese publication JP 2000-299100 (hereinafter referred to as "*the JP'100 publication*").

The instant application is directed to an electrode assembly wherein the claimed inventive concept comprises the specific electrode configuration and the current collecting associated to it.

With reference to claims 1 and 20-21:

Fan et al also disclose a cylindrical embodiment of the device 10 wherein the electrodes are formed on elongated planar film structure in the same fashions and using any of the same combinations described in Figures 1-3a (SECTION 0059), in this case, in an elongated fashion for rolling (*the rolled structure*) while leaving one edge 40 and 42 of each of the first electrode and second electrode respectively uncoated along an entire edge, if the active are coated thereon, to provide current collector edge for communication of current from the elongated electrodes formed in the reference fashion to and from the electrodes. Fan et al teach that any of the

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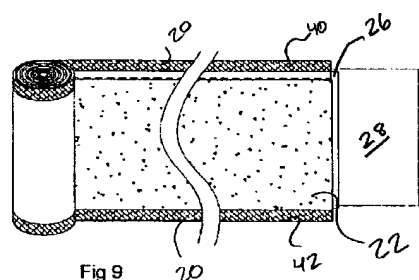
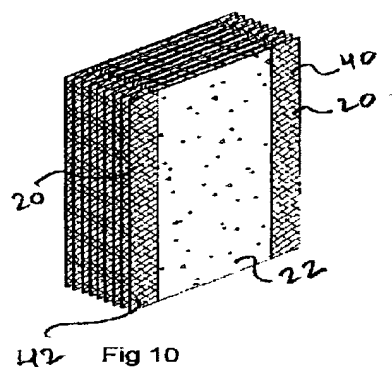
disclosed film and electrode combinations could be used depending on the end use of the device (SECTION 0059).

[0059] FIG. 9 depicts a cylindrical embodiment of the disclosed device **10** wherein the electrodes would both be formed on elongated planar film structure in the same fashions and using any of the same combinations described above in **FIGS. 1 through 3a**, only in an elongated fashion for rolling, while leaving one edge **40** and **42** of each of the first electrode and second electrode respectively uncoated along an entire edge, if the actives are coated as above, to provide a current collector edge for communication of current from the elongated electrodes formed in the above referenced fashion to and from the electrodes. Any of the above referenced film and electrode combinations could be used depending on the end use of the device and would provide the benefit of fire retardance and obviating the need to charge the battery before sale or storage.

Fan et al disclose a prismatic embodiment featuring stacked electrodes (*the stacked structure*) and separators which are placed inside a rectangular case and with one edge **40** and **42** of each formed electrode (both the positive electrode and the negative electrode) uncoated to function as a current collector and to communicate electrical current to and from the electrodes (SECTION 0060).

[0060] FIG. 10 depicts a prismatic embodiment the device featuring stacked electrodes and separators which would be placed inside a rectangular case and with one edge **40** and **42** of each formed electrode uncoated to function as a current collector and to communicate electrical current to and from the electrodes. Any of the above referenced film and electrode combinations could be used depending on the end use of the device and would provide the benefit of fire retardance and obviating the need to charge the battery before sale or storage.

Figures 9-10 below depict the rolled and stacked electrode assembly structure comprising the electrodes, the separator and the communication means:



Fan et al also disclose that sandwiched between the first electrode and the second electrode is a separator (SECTION 0041) wherein the separator is porous (SECTION 0044).

Fan et al also disclosed that a first current collector adjacent to an attached first electrode thereby forming a unitary structure of current collector and electrode; also, there is a second current collector adjacent to an attached second electrode also forming a unitary structure of second electrode and second current collector (SECTION 0041).

Fan et al further teach that the shape of the current collector is generally dimensioned for maximum contact with the inner surface of the cell cap to maximize the transfer of electrical current communicated from the current collector to the cap (SECTION 0042). *Thus, it acts as the mean to communicate electric current to an external device.*

With reference to claims 2 and 22-23:

It is disclosed that an active layer is adhered to the current collector (SECTION 0046 and 0049). As seen in **Figures 9-10** above, the positive surface and the negative surface overlaps

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together and the distances to both the positive conductive edge and the negative conductive edge is substantially equal (FIGURES 9-10).

With reference to claim 3:

Fan et al also disclose a cylindrical embodiment of the device 10 wherein the electrodes are formed on elongated planar film structure in the same fashions and using any of the same combinations described in Figures 1-3a (SECTION 0059), in this case, in an elongated fashion for rolling while leaving one edge 40 and 42 of each of the first electrode and second electrode respectively uncoated along an entire edge, if the active are coated thereon, to provide current collector edge for communication of current from the elongated electrodes formed in the reference fashion to and from the electrodes. Fan et al teach that any of the disclosed film and electrode combinations could be used depending on the end use of the device (SECTION 0059).

Fan et al disclose a prismatic embodiment featuring stacked electrodes and separators which are placed inside a rectangular case and with one edge 40 and 42 of each formed electrode (both the positive electrode and the negative electrode) uncoated to function as a current collector and to communicate electrical current to and from the electrodes (SECTION 0060).

With reference to claims 4-7:

Figure 10 above illustrates a prismatic embodiment featuring stacked electrodes and separators which are placed inside a rectangular case and with one edge 40 and 42 of each formed electrode (both the positive electrode and the negative electrode) uncoated to function as a current collector and to communicate electrical current to and from the electrodes (SECTION 0060/FIGURE 10). *Thus, the positive electrodes and the negative electrodes and their respective*

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uncoated edges are aligned and respective positive active surface area offset from the negative conducting edge.

Regarding claims 8-9:

Fan et al illustrates in Figure 3 that upper electrode 36 has a smaller surface area of active material than lower electrode 38. Conversely, Figure 3a depicts that upper electrode 38 has a greater surface area of active material than electrode 26. It is also noted that Fan et al clearly teach that both rolled and stacked electrode assembly structures may be formed in the same fashion and using any of the same combinations described in Figures 1-3a (SECTION 0059 and 0060). *Thus, Fan et al do encompass the use of different active surface area for negative and positive electrodes.*

As to claim 10:

It is also apparent from **Figures 9-10** above that the positive and negative conducting edges 40, 42 of the electrodes are on the adjacent sides of the electrode assembly as well.

With reference to claims 13, 28 and 32:

Fan et al further teach that the shape of the current collector is generally dimensioned for maximum contact with the inner surface of the cell cap to maximize the transfer of electrical current communicated from the current collector to the cap (SECTION 0042). *Thus, it acts as the mean to communicate electric current to an external device or the battery terminals.*

Fan et al disclose an electrode assembly according to the foregoing description. However, Fan et al do not expressly disclose the specific elongated conductors in contact with substantially the entire length of the positive and negative conducting edges; and the respective pressure engagement feature.

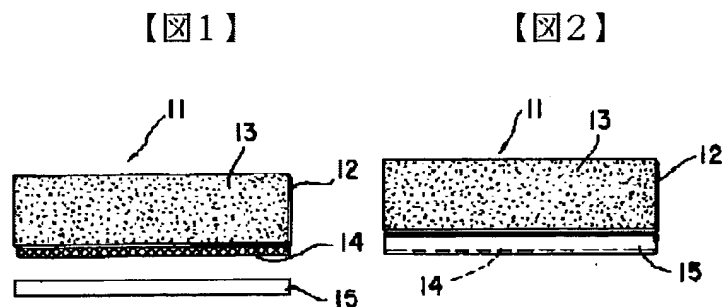
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With respect to claims 1, 11 and 29-30:

The JP'100 publication discloses a rectangular conductive porous substrate 12 of the electrode plate 11 for a storage battery which is filled and coated with a pasty material 13 containing an active material, an uncoated end edge part 14 is left along one longitudinal side thereof (ABSTRACT). After drying and rolling of the pasty material 13, an elongate belt-shaped long sideways current collecting tab 15 (communicating means) is continuously connected to the uncoated end edge part 14 (ABSTRACT).

The JP'100 publication further disclose that when the electrode plate 11 for the storage battery having such a structure is cylindrically wound, the wound current collecting tab 15 projects from the cylindrical electrode plate 11. The cylindrical electrode plate 11 having the current collecting tab 15 projecting from its bottom face is installed into a battery can with a disk-like collector interposed between the current collecting tab 15 and the bottom wall of the battery can (ABSTRACT). *It is noted that the disk-like collector acts as the pressure engagement feature.*

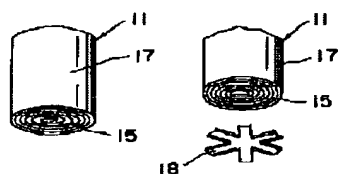
Figures 1-6 and 10 depict the rolled electrode assembly comprising the electrodes, the separator and the communication means:



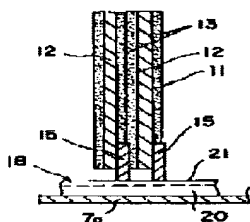
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【図3】

【図4】



【図6】



In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use the specific elongated conductors in contact with substantially the entire length of the positive and negative conducting edges of the JP'100 publication in the electrode assembly of Fan et al as the JP'100 publication disclose that such elongated current collecting tab provides an electrode plate for a storage battery which allows reducing an electric resistance of the electrode plate to obtain a high discharge characteristic by increasing a contact area between the electrode substrate and the elongated current collecting tab. Thus, the elongated current collecting tab enables current collection over the full length of the substance to have a high current collecting efficiency.

As to the pressure engagement feature, it would have been obvious to one skilled in the art at the time the invention was made to use the pressure engagement feature of the JP'100 publication in the electrode assembly of Fan et al because the JP'100 publication discloses that the pressure engagement feature assists in installing and fixing the electrode assembly within the battery can. Thus, the pressure engagement feature provides the necessary mechanical strength to constructively fasten and secure the electrode assembly.

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6. Claims 15-19, 25-27 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fan et al 2003/0134203 in view of the Japanese publication JP 2000-299100 as applied to claims 1 and 13 above, and further in view of Nakanishi et al 2002/0142211.

Fan et al'203 and the JP'100 publication are applied, argued and incorporated herein for the reasons above. However, the preceding prior art does not expressly disclose the specific conductor material and resistivity thereof.

As to claims 16-17, 26 and 31:

Nakanishi et al disclose secondary cells having current collecting structure comprising positive and negative electrode current collector plates (Sections 0007, 0031-0032, 0038) providing uniform collecting efficiency over the entire lengths of the positive and negative electrode (Sections 0018, 0031-0032, 0038) wherein the collector plates comprises a plurality of layers including a copper layer and a metal layer made of a metal such as nickel (Sections 0034). It is disclosed that the copper layer and the additional metal layer provides high conductivity and gives the plate lower electric resistance and higher electric conductivity (SECTION 0037).

As to claims 15 and 25:

It is noted that the specific resistivity is inherent to the construction material of the conductor, that is, the copper material. *Accordingly, products of identical chemical composition (construction material) can not have mutually exclusive properties, and thus, the claimed property the bulk resistivity is necessarily present in the prior art material.*

As for claims 18-19 and 27:

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It is also disclosed that the collector plates comprises a plurality of layers including a copper layer and a metal layer made of a metal such as nickel (SECTION 0034 and 0105). *Thus, it is nickel plated.*

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use the specific conductor material of Nakanishi et al to make the conductor of both Fan et al'203 and the JP'100 publication because Nakanishi et al teach that such construction materials i.e. copper and nickel plated, have high conductivity giving the plates lower electrical resistance and higher electric conductivity. Accordingly, the edge of the electrodes are joined to the copper layer of the collector plate over the entire length thereof, consequently making it possible to collect current from the entire electrode unit uniformly even if the cell is large-sized with an increase in the length of the electrodes. This reduces the potential gradient along the length of the electrodes by providing a uniform current distribution, whereby a high current collecting efficiency can be achieved. *Thus, Nakanishi et al is pertinent to both Fan et al'203 and the JP'100 publication as it shares the same field of endeavor of providing uniform current distribution by employing single unitary structures directly connected to electrodes.*

Response to Arguments

7. Applicant's arguments, see the amendments filed 01/12/04 for specific details, with respect to the rejection(s) of claim(s) 1-11, 13, 15-23 and 25-32 have been fully considered and are persuasive. Therefore, the rejection has been overcome. However, upon further consideration, a new ground(s) of rejection is made as seen above. Accordingly, applicant's

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arguments with respect to the above-mentioned claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro
Examiner
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A handwritten signature in black ink, appearing to read 'RAM', with a large, stylized flourish underneath.